IN THE CLAIMS:

1. (original) A method for accurately determining temperature of a detector panel having a plurality of photodiodes in an X-ray imaging system at the time an X-ray image is taken comprising:

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image value versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image value versus temperature curve for each of said plurality of photodiodes within a processing circuit, said processing circuit coupled within the X-ray imaging system; and

determining the temperature of the detector panel immediately prior to or immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image value versus temperature curve.

2. (original) The method of claim 1, wherein measuring said offset image value comprises measuring an offset image value without an X-ray for at least two known temperatures for a plurality of photodiodes contained on the detector panel prior to installation of said detector panel within the x-ray imaging system.

3. (original) A method for directly controlling temperature of a detector panel of an X-ray imaging system having a plurality of photodiodes comprising:

providing a conditioner unit and a processing circuit and a coldplate, wherein said conditioner unit is fluidically coupled to said coldplate and electronically coupled to said processing circuit;

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image versus temperature curve for each of said plurality of photodiodes within said processing circuit;

determining the temperature of the detector panel immediately prior to or immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image versus temperature curve; and

directing an electrical signal from said processing circuit to said conditioner unit that correlates to the temperature of said detector panel determined from said second offset value, said electrical signal used by said conditioner unit to control the temperature of coolant flowing to said coldplate to maintain said detector panel within a operating temperature range.

4. (original) The method of claim 3, wherein said electrical signal is used by said conditioner unit to also control the flow rate of coolant flowing to said coldplate as a function of said electrical signal.

5. (original) The method of claim 3, wherein measuring said offset image value comprises measuring an offset image value for at least one of the plurality of

photodiodes of the detector panel taken for at least two known temperatures without X-ray prior to installation of said detector panel within the x-ray imaging system.

6. (original) The method of claim 3, wherein said conditioner unit decreases the temperature of coolant flowing to said coldplate when the temperature of said detector panel is above said operating temperature range.

7. (currently amended) The method of claim 6, wherein said conditioner unit increases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is above said operating temperature range.

8. (currently amended) The method of claim 3, wherein said conditioner unit increases the temperature of coolant flowing to said coldplate when the temperature of said detector panel is below said ~~narrow~~ operating temperature range as measured by said second offset value.

9. (currently amended) The method of claim 8, wherein said conditioner unit ~~increases~~ decreases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is below said operating temperature range as measured by said second offset value.

10. (original) A method for improving closed-loop control of cooling in an X-ray imaging system comprising:

determining an amount of photodiode leakage exhibited by at least one of a plurality of photodiodes immediately prior to or immediately after X-ray images are taken;

controlling the coolant temperature of coolant flowing from a conditioner unit to a coldplate contained within the X-ray imaging system as a function of said amount of photodiode leakage.

11. (original) The method of claim 10, wherein determining an amount of photoleakage comprises:

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image value versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image value versus temperature curve for each of said plurality of photodiodes within a processing circuit;

determining the temperature of the detector panel immediately prior to or immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image value versus temperature curve.

12. (currently amended) An ~~X-Ray~~ X-ray imaging system having a closed-loop cooling system comprising:

a detector panel having a plurality of photodiodes;

a coldplate closely coupled with said detector panel;

a processing circuit electrically coupled with at least one of said plurality of photodiodes, said processing circuit capable of producing a signal representing the temperature of the detector panel as measured immediately prior to or after the acquisition of an X-ray by the X-ray imaging system by measuring the amount of dark current generated by said at least one of said plurality of photodiodes and determining the temperature of said detector panel located near said at least one of said plurality of photodiodes as a function of said amount of dark current; and

a conditioner unit fluidically coupled with said coldplate and electrically coupled with said processing circuit, said conditioner unit capable of maintaining said detector panel within an operating temperature range.

13. (original) The X-ray imaging system of claim 12, wherein said processing circuit has a stored offset image value versus temperature curve for each of said at least one of said plurality of photodiodes, said processing circuit capable of determining the temperature of said detector panel immediately prior to or immediately after acquiring an X-ray image by measuring an offset image value of said one of said plurality of photodiodes without an X-ray and converting said offset image value using said stored offset image value versus temperature curve to a temperature value representing the temperature of the detector panel, wherein said temperature value is subsequently converted to a signal by said processing circuit corresponding to the temperature of the detector panel.

14. (original) The X-ray imaging system of claim 12, wherein an offset image value for each of said at least one of said plurality of photodiodes is measured for at least two known temperatures and stored within said stored offset image value versus temperature curve prior to installing said detector panel into the X-ray imaging system.

15. (original) The X-ray imaging system of claim 12, wherein said conditioner unit decreases the temperature of coolant flowing to said coldplate from said conditioner unit when the temperature of said detector panel is above said operating temperature range.

16. (original) The X-ray imaging system of claim 12, wherein said conditioner unit increases the flow rate of coolant flowing to said coldplate from said

conditioner unit when the temperature of said detector panel is above said operating temperature range.

17. (original) The X-ray imaging system of claim 12, wherein said conditioner unit increases the temperature of coolant flowing to said coldplate from said conditioner unit when the temperature of said detector panel is below said operating temperature range.

18. (original) The X-ray imaging system of claim 12, wherein said conditioner unit decreases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is below said operating temperature range.

19. (new) A method for accurately determining temperature of a detector panel having a plurality of photodiodes in an X-ray imaging system at the time an X-ray image is taken comprising:

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image value versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image value versus temperature curve for each of said plurality of photodiodes within a processing circuit, said processing circuit coupled within the X-ray imaging system; and

determining the temperature of the detector panel immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image value versus temperature curve.

20. (new) The method of claim 19, wherein measuring said offset image value comprises measuring an offset image value without an X-ray for at least two known temperatures for a plurality of photodiodes contained on the detector panel prior to installation of said detector panel within the x-ray imaging system.

21. (new) A method for directly controlling temperature of a detector panel of an X-ray imaging system having a plurality of photodiodes comprising:

providing a conditioner unit and a processing circuit and a coldplate, wherein said conditioner unit is fluidically coupled to said coldplate and electronically coupled to said processing circuit;

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image versus temperature curve for each of said plurality of photodiodes within said processing circuit;

determining the temperature of the detector panel immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image versus temperature curve; and

directing an electrical signal from said processing circuit to said conditioner unit that correlates to the temperature of said detector panel determined from said second offset value, said electrical signal used by said conditioner unit to control the temperature of coolant flowing to said coldplate to maintain said detector panel within a operating temperature range.

22. (new) The method of claim 21, wherein said electrical signal is used by said conditioner unit to also control the flow rate of coolant flowing to said coldplate as a function of said electrical signal.

23. (new) The method of claim 21, wherein measuring said offset image value comprises measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray prior to installation of said detector panel within the x-ray imaging system.

24. (new) The method of claim 21, wherein said conditioner unit decreases the temperature of coolant flowing to said coldplate when the temperature of said detector panel is above said operating temperature range.

25. (new) The method of claim 24, wherein said conditioner unit increases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is above said operating temperature range.

26. (new) The method of claim 21, wherein said conditioner unit increases the temperature of coolant flowing to said coldplate when the temperature of said detector panel is below said operating temperature range as measured by said second offset value.

27. (new) The method of claim 26, wherein said conditioner unit decreases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is below said operating temperature range as measured by said second offset value.

28. (new) A method for improving closed-loop control of cooling in an X-ray imaging system comprising:

determining an amount of photodiode leakage exhibited by at least one of a plurality of photodiodes immediately after X-ray images are taken;

controlling the coolant temperature of coolant flowing from a conditioner unit to a coldplate contained within the X-ray imaging system as a function of said amount of photodiode leakage.

29. (new) The method of claim 28, wherein determining an amount of photoleakage comprises:

measuring an offset image value for at least one of the plurality of photodiodes of the detector panel taken for at least two known temperatures without X-ray;

extrapolating an offset image value versus temperature curve for each of said measured offset image values for each of said at least one of the plurality of photodiodes;

storing said extrapolated offset image value versus temperature curve for each of said plurality of photodiodes within a processing circuit;

determining the temperature of the detector panel immediately after use of the X-ray imaging system by measuring a second offset image value taken without an X-ray for said at least one of said plurality of photodiodes and comparing said second offset image value to said offset image value versus temperature curve.

30. (new) An X-ray imaging system having a closed-loop cooling system comprising:

a detector panel having a plurality of photodiodes;

a coldplate closely coupled with said detector panel;

a processing circuit electrically coupled with at least one of said plurality of photodiodes, said processing circuit capable of producing a signal representing the temperature of the detector panel as measured immediately after the acquisition of an X-ray by the X-ray imaging system by measuring the amount of dark current generated by

said at least one of said plurality of photodiodes and determining the temperature of said detector panel located near said at least one of said plurality of photodiodes as a function of said amount of dark current; and

a conditioner unit fluidically coupled with said coldplate and electrically coupled with said processing circuit, said conditioner unit capable of maintaining said detector panel within an operating temperature range.

31. (new) The X-ray imaging system of claim 30, wherein said processing circuit has a stored offset image value versus temperature curve for each of said at least one of said plurality of photodiodes, said processing circuit capable of determining the temperature of said detector panel immediately prior to or immediately after acquiring an X-ray image by measuring an offset image value of said one of said plurality of photodiodes without an X-ray and converting said offset image value using said stored offset image value versus temperature curve to a temperature value representing the temperature of the detector panel, wherein said temperature value is subsequently converted to a signal by said processing circuit corresponding to the temperature of the detector panel.

32. (new) The X-ray imaging system of claim 30, wherein an offset image value for each of said at least one of said plurality of photodiodes is measured for at least two known temperatures and stored within said stored offset image value versus temperature curve prior to installing said detector panel into the X-ray imaging system.

33. (new) The X-ray imaging system of claim 30, wherein said conditioner unit decreases the temperature of coolant flowing to said coldplate from said conditioner unit when the temperature of said detector panel is above said operating temperature range.

34. (new) The X-ray imaging system of claim 30, wherein said conditioner unit increases the flow rate of coolant flowing to said coldplate from said conditioner unit when the temperature of said detector panel is above said operating temperature range.

35. (new) The X-ray imaging system of claim 30, wherein said conditioner unit increases the temperature of coolant flowing to said coldplate from said conditioner unit when the temperature of said detector panel is below said operating temperature range.

36. (new) The X-ray imaging system of claim 30, wherein said conditioner unit decreases the flow rate of the coolant flowing to said detector panel when the temperature of said detector panel is below said operating temperature range.